# 03050109-150

***(Saluda River/Lake Murray)***

## General Description

Watershed 03050109-150 is located in Laurens, Newberry, Saluda, and Greenwood Counties and consists primarily of the ***Saluda River*** and its tributaries from the Lake Greenwood dam to the ***Lake Murray*** headwaters. The watershed occupies 182,441 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes-Herndon series. The erodibility of the soil (K) averages 0.28 and the slope of the terrain averages 15%, with a range of 2-45%. Land use/land cover in the watershed includes: 3.4% urban land, 27.0% agricultural land, 4.7% barren land, 62.5% forested land, 0.7% forested wetland (swamp), and 1.7% water.

This section of the Saluda River flows out of Lake Greenwood and is joined by Halfway Swamp (Thompsons Creek) and Sharps Branch near the Town of Chappells. Further downstream, Terrapin Creek and Mill Creek enter the river, followed by the Little River watershed, Rocky Branch, and Tosity Creek. Beaverdam Creek (Welch Creek) flows past the Town of Silverstreet and drains into the Saluda River arm of Lake Murray.

The Bush River originates near the City of Clinton where it accepts drainage from Shell Creek (Sand Creek). Further downstream, near the City of Newberry, Rocky Creek, Big Beaverdam Creek (Reedy Creek), and Scott Creek flow into the Bush River. The Bush River then accepts drainage from Timothy Creek (Kinards Creek, Dewalt Creek) near the Town of Prosperity and drains into the Saluda River arm of the lake. Big Creek enters the lake just downstream of the confluence of the Saluda and Bush Rivers. There are a total of 276.8 stream miles and 3,430.5 acres of lake waters in this watershed, all classified FW. As a reach of the Saluda River, this watershed accepts the drainage of all streams entering the river upstream of the watershed.

## Surface Water Quality

| Station # | Type | Class | Description |
|---|---|---|---|
| S-186 | P/W | FW | SALUDA RIVER AT SC 34, 6.5 MILES ESE OF NINETY SIX |
| S-295 | P/W | FW | SALUDA RIVER AT S.C. ROUTE 39 |
| S-047 | W/INT | FW | SALUDA RIVER AT SC 121 |
| S-852 | BIO | FW | BEAVERDAM CREEK AT SR 83 |
| S-310 | W/INT | FW | LAKE MURRAY, SALUDA RIVER ARM, 3.8 KM UPSTREAM OF SC 391 |
| S-042 | P/W | FW | BUSH RIVER AT SC 560 S OF JOANNA |
| S-046 | S/W | FW | BUSH RIVER AT SC ROUTE 34 |
| S-044 | S/W | FW | SCOTT CREEK AT SC 34, SW OF NEWBERRY |
| RS-01044 | RS01/BIO | FW | BUSH RIVER AT S-36-395 3 MI S OF NEWBERRY |
| S-102 | W | FW | BUSH RIVER AT S-36-41, 8.5 MILES S OF NEWBERRY |
| S-309 | S/SUMM | FW | LAKE MURRAY, BUSH RIVER ARM, 4.6 KM UPSTREAM OF SC 391 |
| S-223 | P/SPRP | FW | LAKE MURRAY AT SC 391 (BLACKS BRIDGE) |

***Saluda River -*** There are three SCDHEC monitoring sites along this section of the Saluda River. At the upstream site ***(S-186)***, aquatic life uses are partially supported due to occurrences of copper in excess of the aquatic life acute standards. There is a significant decreasing trend in pH. Significant decreasing

trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria suggests improving conditions for this parameter.

At the midstream site ***(S-295)***, aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life acute standards. There is a significant decreasing trend in pH. Significant decreasing trends in turbidity suggest improving conditions for this parameter. Recreational uses are fully supported at this site. At the downstream site ***(S-047)***, aquatic life uses are partially supported due to pH excursions. There is a significant increasing trend in pH. Recreational uses are fully supported at this site.

***Saluda River Arm of Lake Murray –*** There are two SCDHEC monitoring stations in this arm of Lake Murray. Aquatic life uses are not supported at the uplake site ***(S-310)*** due to pH excursions. Recreational uses are fully supported. At the downlake site ***(S-223)***, aquatic life uses are not supported due to pH and total phosphorus concentration excursions. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. Recreational uses are fully supported, and a significant decreasing trend in fecal coliform bacteria suggests improving conditions for this parameter.

***Beaverdam Creek (S-852) -*** Aquatic life uses are partially supported based on macroinvertebrate community data.

***Bush River -*** There are four monitoring sites along the Bush River. At the furthest upstream site ***(S-042)***, aquatic life uses are not supported due to dissolved oxygen excursions. In addition, there are significant decreasing trends in dissolved oxygen concentration. Significant decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations, and total suspended solids suggest improving conditions for these parameters. Recreational uses are fully supported, and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Further downstream ***(S-046)***, aquatic life uses are fully supported. Prior to 2001, this was a secondary monitoring station and sampling was intentionally biased towards periods with potentially low dissolved oxygen concentrations. There is a significant increasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions; however a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

At the next site downstream ***(RS-01044)***, aquatic life uses are partially supported based on macroinvertebrate community data. Recreational uses are fully supported at this site. At the furthest downstream site ***(S-102)***, aquatic life uses are fully supported. A significant decreasing trend in turbidity suggests improving conditions for this parameter. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria suggests improving conditions for this parameter.

***Scott Creek (S-044)* -** Prior to 2001, this was a secondary monitoring station and sampling was intentionally biased towards periods with potentially low dissolved oxygen concentrations. Aquatic life uses are fully supported, but there is a significant decreasing trend in dissolved oxygen. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria suggests improving conditions for this parameter.

***Bush River Arm of Lake Murray (S-309)* -** Prior to 2001, this was a secondary monitoring station and sampling was intentionally biased towards periods with potentially low dissolved oxygen concentrations. Aquatic life uses are not supported due to pH and total phosphorus concentration excursions. Recreational uses are fully supported.

*A fish consumption advisory has been issued by the Department for mercury and includes portions of a stream within this watershed (see advisory p.39).*

## NPDES Program

### *Active NPDES Facilities*

| ***RECEIVING STREAM*** / ***FACILITY NAME*** / ***PERMITTED FLOW @ PIPE (MGD)*** | ***NPDES#*** / ***TYPE*** / ***COMMENT*** |
|---|---|
| BUSH RIVER<br>CITY OF CLINTON/GARY ST WWTP<br>PIPE #: 01A-01C, 02A-02C, 03A-03C FLOW: M/R | SCG645004<br>MINOR DOMESTIC |
| BUSH RIVER<br>CITY OF NEWBERRY/BUSH RIVER WWTP<br>PIPE #: 001 FLOW: 3.22, 3.50, 4.80 | SC0024490<br>MAJOR DOMESTIC<br>TIER I, II, III |
| BUSH RIVER<br>LAURENS COUNTY W&S/CLINTON-JOANNA<br>PIPE #: 001 FLOW: 2.750 | SC0037974<br>MAJOR DOMESTIC |
| BUSH RIVER<br>NEWBERRY COUNTY W&SA/PLANT #1<br>PIPE #: 001 FLOW: 0.651 | SC0040860<br>MINOR DOMESTIC<br>Proposed to be eliminated to Newberry County/Cannons Creek WWTP in Broad River Basin. |

## Nonpoint Source Management Program

### *Land Disposal Activities*

**Landfill Facilities**

| ***LANDFILL NAME*** / ***FACILITY TYPE*** | ***PERMIT #*** / ***STATUS*** |
|---|---|
| CITY OF NEWBERRY LANDFILL<br>DOMESTIC | DWP-023<br>CLOSED |

### *Mining Activities*

| *MINING COMPANY*<br>*MINE NAME* | *PERMIT #*<br>*MINERAL* |
|---|---|
| RICHTEX CORP.<br>HICKS MINE | 0277-47<br>SHALE |
| RICHTEX CORP.<br>BAUKNIGHT MINE | 0155-81<br>SHALE |

## Water Quantity

| *WATER USER*<br>*STREAM* | *REGULATED CAPACITY (MGD)*<br>*PUMPING CAPACITY (MGD)* |
|---|---|
| CITY OF NEWBERRY<br>SALUDA RIVER | 16.0<br>26.0 |

## Growth Potential

This watershed contains the City of Newberry and portions of the City of Clinton and the Towns of Joanna, Prosperity, and Silverstreet. The growth along the Saluda arm of Lake Murray has been strong and is for the most part residential. The Town of Prosperity is serviced by the Newberry County Water and Sewer Authority, which discharges into Bush River. Bush River continues to be limited in terms of assimilative capacity, and Newberry County has proposed a larger regional facility, which would discharge within the Broad River Basin. This would in turn facilitate growth in the area.

## Watershed Protection and Restoration Strategies

### *Total Maximum Daily Loads (TMDLs)*

Portions of the Bush River have been placed on the South Carolina's 2000 303(d) list of impaired water bodies due to violations of the fecal coliform bacteria water quality standard. Fecal coliform bacteria are an indicator of possible contamination by fecal matter and are thus a public health concern due to the potential for exposure to pathogens through contact recreation. Monitoring stations S-046 and S-102 failed to attain recreational use support by exceeding the state standard of 400 colonies per 100ml sample. During the assessment period of 1994 through 1998 standards were exceeded in 31% of samples taken at S-046 and 35% of samples taken at S-102. The Clean Water Act requires that a Total Maximum Daily Load be developed for all pollutants causing impairment of Waters of the State. This TMDL was developed to determine the maximum amount of fecal coliform bacteria that the Bush River can receive from both point and nonpoint sources and still meet water quality standards. EPA's BASINS model and Watershed Characterization System were used to estimate the continuous in-stream concentration of fecal coliform bacteria. Based on this estimation, the sum of the allowable loads of fecal coliform bacteria pollution from all contributing point and nonpoint sources was calculated, taking into consideration seasonal variations. Conservative assumptions regarding pollutant sources in the watershed allow for a margin of safety to ensure that the water body can be used for recreational use purposes consistent with State and Federal water quality goals. Due to limits in source identification information, water quality

data, land use, and other data limitations, this TMDL is only an initial estimate. This TMDL will begin the process of a phased implementation of measures that will ultimately result in achievement of fecal coliform bacteria standards in the Bush River. As implementation progresses, and/or more data are obtained, this TMDL may be revised accordingly to facilitate the most efficient remediation of fecal coliform bacterial pollution to the Bush River.

## *Special Projects*

### Assessing Water Quality in the Saluda River Watershed

Furman University has recently completed a three-year project that was to determine the sources of impairments on several tributaries and reaches of the Saluda River. These impairments include high fecal coliform counts detected in the watersheds of the Middle Saluda River, the South Saluda River, a small tributary to the Saluda River north of the Town of Pelzer, Broad Mouth Creek, Big Brushy Creek, the **Bush River, Scotts Creek**, and the Little River; high phosphorous concentrations found in the Bush River; low dissolved oxygen levels in Coronaca Creek; and an impaired macroinvertebrate community in Broad Mouth Creek. A stream sampling program was conducted in 2001, 2002, and 2003 with 182 sites sampled within the ten impaired areas. Each site was sampled from 3 to 7 times for water chemistry and for total coliform, *E. coli*, and heterotrophic bacterial counts. In addition, selected sites were sampled for fish abundance and diversity and for macroinvertebrate abundance and diversity.

### TMDL Implementation on Bush River

A new effort to combat bacterial pollution in the Bush River, funded through SCDHEC's §319 grant, is underway. The Newberry Soil and Water Conservation District (SWCD), acting as lead organization, has initiated a three-year project that promises to implement bacteria runoff control measures in critical areas throughout the watershed. Reductions in fecal coliform bacteria were called for in the Bush River Total Maximum Daily Load (TMDL) developed by DHEC in 2001 (see above). If successful, the Bush River TMDL Project will result in improved water quality and consistent attainment of the water quality standard for fecal coliform. In the last SCDHEC Watershed Water Quality Assessment for the Saluda River Basin, the Bush River failed to meet water quality standards at two monitoring stations about thirty percent of the time. To correct this problem, the project sponsors will implement a combination of BMPs on a watershed scale that include detailed waste and grazing management procedures, engineered BMPs focusing on riparian zones, septic system upgrades including constructed wetlands, and an extensive educational campaign targeted towards homeowners. The Newberry SWCD has recruited a number of partners in this effort including the Laurens SWCD, USDA Natural Resources Conservation Service, Clemson Extension Service, the University of South Carolina, Rural Development Agency, Newberry Beef Cattlemen's Association, and the S.C. Department of Natural Resources. The Bush River TMDL Project, using the diverse expertise available in this partnership, should result in demonstrable improvement to the water quality in the Bush River.